

REMARKS

Reconsideration and withdrawal of the rejections set forth in the Office Action are respectfully requested in view of this amendment and the following reasons. Claim 1 has been amended. Claims 1, 2, and 4 are pending in this application.

Claim 1 has been amended to change the wording and further define the claimed subject matter. Support for these features may be found at least in previous claim 1 and paragraph [0013] of the present application as published and in Figs. 3A and 8A. Thus, it is respectfully submitted that the above amendments introduce no new matter within the meaning of 35 U.S.C. §132. For at least these reasons, entry of the present Amendment is therefore respectfully requested. Accordingly, Applicants request reconsideration and timely withdrawal of the pending rejections for the reasons discussed below.

Rejections Under 35 U.S.C. §112

Claims 1, 2, and 4 stand rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. Particularly, claim 1 reciting the language “amorphous metal oxide” and “the metal oxide comprises a metal having an open structure” is not enabling to one of ordinary skill in the art because a metal oxide cannot be amorphous and have open structure at the same time.

In response to this rejection, the language “the metal oxide comprises a metal having an open structure,” recited in claim 1, line 6, has been deleted without prejudice or disclaimer, and

the language “amorphous metal oxide” has been replaced with -- amorphous, porous metal oxide --. In addition, the language “wherein the metal oxide is selected from oxides of tantalum, silicon, titanium, and nickel” has been replaced with -- wherein the metal oxide is a titanium oxide --.

By this amendment, Applicants believe that this rejection has overcome. Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §112, first paragraph, rejection of claims 1, 2, and 4.

Claims 1, 2, and 4 stand rejected under 35 U.S.C. §112, second paragraph, as being allegedly indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Particularly, claim 1 reciting the language “amorphous metal oxide” and “the metal oxide comprises a metal having an open structure” is indefinite because a metal oxide cannot be amorphous and have open structure at the same time. In addition, the Examiner indicated that claims 1, 2, and 4 are also indefinite because the term “open-structured transition metal” refers to a type of metal, and therefore, cannot limit the type of metal oxide as specified in the claim.

As noted above with regard to the 35 U.S.C. §112, first paragraph rejection, the language “the metal oxide comprises a metal having an open structure,” recited in claim 1, line 6, has been deleted without prejudice or disclaimer, and the language “amorphous metal oxide” has been replaced with -- amorphous, porous metal oxide --. In addition, the language “wherein the metal oxide is selected from oxides of tantalum, silicon, titanium, and nickel” has been replaced with --

wherein the metal oxide is a titanium oxide --.

By this amendment, Applicants believe that this rejection has been overcome. With respect to the term “open-structured transition metal,” as allegedly recited in claims 1, 2, and 4, Applicants respectfully submit that none of the claims includes this term. Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §112, second paragraph, rejection of claims 1, 2, and 4.

Rejections Under 35 U.S.C. §103

Claims 1, 2, and 4 stand rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Mahe, *et al.*, “Electrochemical behavior of platinum-coated Ta/Ta₂O₅ electrodes” (“Mahe”) in view of Park, *et al.*, “Pt-WO_x electrode structure for thin-film fuel cells” (“Park”). Applicants respectfully traverse this rejection for at least the following reasons.

To establish an obviousness rejection under 35 U.S.C. § 103(a), four factual inquiries must be examined. The four factual inquiries include (a) determining the scope and contents of the prior art; (b) ascertaining the differences between the prior art and the claims in issue; (c) resolving the level of ordinary skill in the pertinent art; and (d) evaluating evidence of secondary consideration. *Graham v. John Deere*, 383 U.S. 1, 17-18 (1966). In view of these four factors, the analysis supporting a rejection under 35 U.S.C. 103(a) should be made explicit, and should “identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements” in the manner claimed. *KSR Int'l. Co. v. Teleflex, Inc.*, 550 U.S. 398 (2007). Furthermore, even if the prior art may be combined, there must be a reasonable

expectation of success, and the reference or references, when combined, must disclose or suggest all of the claim limitations. See *in re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Assuming *arguendo* that the references may be combined and a reasonable expectation of success exists, the combined references do not disclose or suggest all of the claim features.

Claim 1, as amended, recites, *inter alia*:

... an amorphous, porous metal oxide on the substrate ...
... wherein the metal oxide is a *titanium oxide*. (Emphasis added)

Mahe discloses a Ta/Ta₂O₅/Pt electrode manufactured by depositing Pt on a Ta/Ta₂O₅ substrate by sputtering or by cathodic deposition. This Ta/Ta₂O₅/Pt electrode has Pt as target materials and has a three-phase structure of Ta/Ta₂O₅/Pt (See page 2308, 1st Col., lines 11-13).

Meanwhile, an embodiment of the present application provides a glass plate coated with a fluorine-dropped tin oxide as a substrate (See Example 2); Pt and metal oxide TiO₂ as target materials; and a bi-phase structure of Pt/metal oxide (TiO₂).

In accordance with the presently claimed subject matter, the metal oxide is an amorphous, porous TiO₂. Mahe fails to teach this claim feature since it merely discloses a Ta/Ta₂O₅/Pt electrode.

Furthermore, as noted in the previous response of October 10, 2008, Park also fails to teach a titanium oxide because the reference merely discloses an electrode including “Pt metal” and an amorphous metal oxide including “tungsten.” The Examiner agrees on this difference (Office Action, page 6, section 10).

Accordingly, even if one of ordinary skill in the art combined the teachings of Mahe and

Park, the combined references still do not teach or suggest the above-recited feature of claim 1.

Since the combined references fails to teach every recited claim feature, claim 1 is not obvious over the references.

Furthermore, the claimed subject matter leads to unexpected results, which cannot be derived from each teaching of Mahe or Park. The refractive index of TiO_2 ($n = 2.3\sim 2.5$) of the present application is much higher than any of the refractive indices of Mahe's Ta_2O_5 ($n = 2.1$) and Park's WO_x ($n = 1.7\sim 1.8$). The use of TiO_2 leads to an enhancement of the reflectivity of light, thereby improving the efficiency of a solar cell (See paragraph [0030] of the present application as published). Thus, even in view of this unexpected effect, the subject matter of claim 1 is not obvious over Mahe and Park.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejection of claim 1. Claims 2 and 4 depend from claim 1 and are allowable for at least this reason. Since none of the other prior art of record, whether taken alone or in any combination, discloses or suggests all the features of the claimed subject matter, Applicants respectfully submit that independent claim 1, and all the claims that depend therefrom, are allowable.

CONCLUSION

Applicants believe that a full and complete response has been made to the pending Office Action and respectfully submit that all of the stated grounds for rejection have been overcome or rendered moot. Accordingly, Applicants respectfully submit that all pending claims are allowable and that the application is in condition for allowance.

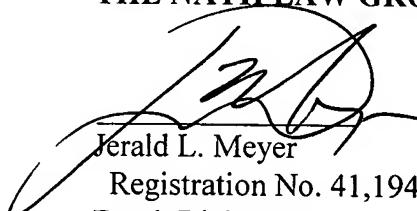
Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicants' undersigned representative at the number below to expedite prosecution.

Prompt and favorable consideration of this Reply is respectfully requested.

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